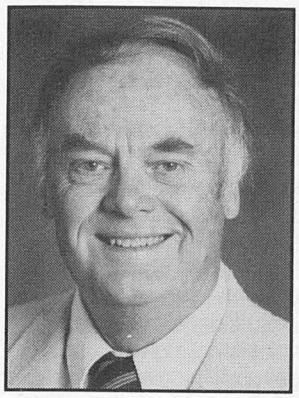

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OPENING SESSION
Thursday, October 19, 1989

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KEYNOTE ADDRESS

Thank you for letting me be here. I'm glad safety is the theme of your Forum.

It's obligatory in speeches like this to recite a few of the grim statistics, but mostly my talk is going to be upbeat.

We are losing a great deal of what is valuable to our society by virtue of highway accidents. These accidents produce about 130 deaths a day, 47,000 a year. There are several million injuries per year; it depends on how you count the injuries—somewhere around two to four million people. In non-war time, such as we enjoy now, the biggest single source of paralyzing injuries is highway accidents. And, of course, aside from the ruined lives and the agonizing readjustments survivors must endure, these crashes are a great cost to victims, their families, and to society as a whole. It's a huge sum (some estimates are $10 billion, some $50 billion). It represents a very significant part of our tax dollars and of our health-care dollars.

On the other hand, I think we have done pretty well over the years if you compare our highway safety situation today with that of 1925. We currently have a death rate, per 100 million vehicle miles, that is about one-seventh as large now as it was in 1925. If we were still having fatalities at the same rate today as we had in 1925, we would be killing about 320,000 to 330,000 people a year instead of 45,000. We have improved a startling amount when you compare that period of time.

Even though we have very large numbers of casualties, the individual events are very improbable. As a matter of fact, if you look at the number of miles of travel for each fatality and translate that to individual driving, it is

pretty impressive. Surveys indicate that the average person drives approximately 10,000 or 11,000 miles a year. If you consider how many years you would have to drive at 11,000 miles a year to build up enough miles to be the statistical equivalent of one fatality, you would've had to get the old car out at 2000 B.C. and cruise around in Egypt during the Ptolemaic period of the pharaohs, work your way on up into Greece during the Age of Pericles, fool around there for a few hundred years, on to Europe during the middle ages, over to the coast to catch William the Conqueror as he invaded England, work your way around there for a few hundred years, come west to the New World—and even today you would still have a good many years of driving (at 11,000 miles a year) to build up enough miles to match the statistical exposure equivalent of one fatality—about 4,000 years of driving. That tells us it's pretty safe and it's pretty difficult to make substantial improvements because we would have to take an already low-probability event and reduce the probability even further.

With regard to traffic safety, the USA is pretty well ahead of almost every other country on earth. In fact, up until about 10 years ago our death rate, taking into account miles driven, was well ahead of any other nation. Now a few other nations have pretty much caught up with us. Australia, for example, is getting in the same range as us, partially because of the success of their seat belt laws and their dramatic initiatives in respect to drunk driving. Still, we are ahead of most other countries. They're on somewhat the same improvement curve as we are but, in general, they're several years, even several decades, behind us.

At this time, three countries are in the "big leagues" with respect to traffic casualties. The United States, China, and Russia are three nations in which the annual fatality toll is upwards of 50,000 per year. However, what is very dramatic about that is that in China they manage to kill nearly 50,000 people a year with only one-twentieth the number of motor vehicles we have in this country. In Russia, they create the 50,000 fatalities with one-fourth to one-fifth as many vehicles.

If you assume that those vehicles have exposure patterns similar to our own, it would indicate the death rate in China per unit exposure is of the order of 20 times as high as it is in the U.S. If you multiply our own experience by 20, that is upward of a million deaths per year. In South Korea, the death rate appears to be around 12 times as high per unit exposure as it is in this country. That gives you some picture of how far ahead we are, how much more safety we enjoy per unit exposure in the United States than in some of the countries around the world that are motorizing at this point.

In a lot of developing countries, the nature of the problem is quite different from ours. In the U.S., vehicle occupants account for a big category of our deaths. In the last 20 years in particular, the USA has devoted a lot of attention to making the interior of cars safer through occupant restraints, energy absorbing materials, etc. But, in many other countries the *exterior* of the vehicle accounts for more casualties because in such other countries pedestrians and bicyclists are the major victims.

In China, for example, only about five percent of fatalities are vehicle occupants. The biggest category (50 percent or more) are pedestrians or

bicyclists. So, the exterior of the car rather than the interior is a greater instrument of fatalities in much of the rest of the world.

Road-user behavior is quite different in some countries that are motorizing rather rapidly. Road-user behavior is perhaps worse than we had even back in the 1930s. One of the things noteworthy in rural China is that many drivers don't use headlights after dark—they only use parking lights and flick the headlights on every few seconds to scan what is in front of them. Most of what *is* in front of them is bicycles, painted black and without reflectors.

Many situations in these developing countries reflect the fact that they don't have very much money to throw at the problem. (By the way—and this is a subject of another speech—I think one of the things we really need is a systematic transfer of highway safety knowledge from highly motorized countries of Europe, North America, Australia, and Japan to the motorizing nations like China, India, Ethiopia, and other nations.) These nations are relatively poor and can't throw a lot of money into the problem. There are, however, some relatively low-cost, highly effective initiatives that could be made available, to permit these countries to jump ahead on the curve.

In contrast to many foreign countries, one notices how well-behaved American drivers are. I think drivers in the United States are probably more disciplined than in almost any other place on earth. There are a few places where it is not much different—in Canada, for instance, and a few other places.

Thus, for 60 years, the USA has been going through this act of balancing the mobility that our system brings us and that we need with the safety requirements of operating that system.

I want to talk for a few minutes (in a semi light-hearted way) about some of the approaches our country has used over the last half century. I want to tie that in to some of the prevailing political philosophies that have existed during that time. I'll start off by stating a couple of assumptions, which you may or may not accept.

It seems to me that we have in most areas of American life a sort of creative tension between political conservatives and political liberals as it applies to highway safety. I'm proceeding on the assumption that in this country highway safety had its origins in a fairly politically conservative environment. That grows out of my assumption that, police professionals, highway engineers, and auto industry executives were the primary decision makers in the early days of highway safety in the USA, and that people in these groups more often tend to be politically conservative. I'm further assuming that in the more recent years there has been a touch of political liberalism in our highway safety movement that stems from involvement of public health professionals and consumer advocates. My assumption is that members of these latter groups tend to be more politically liberal.

Those are my basic assumptions. In this country, for the most part, highway safety originated within the ranks of roadway engineers and police. They had the responsibility for the transportation system and its safe operation.

I think their political philosophy has influenced our programs. That is perfectly natural. One does what one is comfortable with, and that tends to grow out of one's own basic philosophy.

There are some differences between these approaches and some of them are amusing. For example, I've noticed that liberals don't like to use the word "accident," they like to use the word "crash." More conservative people perhaps are content to use the word accident. Liberals want to use the word crash because if you use the word accident you will think it's a random event and you can't do anything about them.

Among people with a more conservative philosophy, there is an approach to highway safety that perhaps more emphasizes individual responsibility. In this view the accident problem is regarded as being largely an outgrowth of illegal or reprehensible behavior on the part of road users. They tend to shy away from approaching the problem through the instrumentalities of society, such as government regulation of corporations or by passive devices like airbags and energy-absorbing guardrails and so forth.

In contrast, it seems to me that the people with more liberal philosophy like to stay away from dealing with the individual. They tend to look to government regulation of the automobile industry and government responsibility in dealing with the instrumentalities of society, and they embrace the government control of industry, particularly the auto industry. So, they favor airbags, etc.

Each of those two approaches also has a theory of human behavior. In the earlier days, when there was a predominant influence of conservative elements, the watchword (with respect to human behavior) dealt with the "nut-behind-the-wheel," or "get the bad driver off the road." This implied that somehow, we can achieve highway safety if we can just identify the people who are "nuts" or who are reprehensible or bad guys causing all the problems. Then we can either do something *for* them or *to* them and we will achieve highway safety. That's the behavior theory I associate with the conservative side.

The liberal side also has a behavior theory and their catch phrase is "education doesn't work." Liberals are fond of telling you that studies of driver education, for example, fail to prove that driver education reduces crashes at all. (That's true, that *is* what the research shows). They will go on to say that you can't really do anything about human behavior and, therefore, we need automatic things to protect the people because we can't do it through changing attitudes or behavior. We need to do it, they say, through air bags and automatic seat belts and breakaway poles and energy-absorbing guardrails and that sort of thing.

I don't think either of those are very good behavioral theories. Rather, I think they're both political catch phrases. The political catch phrase calling for dealing with the nut-behind-the-wheel theory is designed to focus attention on errant drivers and to put the resources of society in that direction, so we don't have to interfer with the car industry and can build roads like we want, etc.

On the other side, the political purpose of the catch phrase that "education doesn't work" is to counter the previous notion so that we don't spend all our time trying to change drivers. Instead, we do things to improve car safety and to make highways more crashworthy.

The failure of this nut-behind-the-wheel theory was shown in the literature as early as the 1930s by an author named Forbes. He showed that if everybody in an entire state, in one year, with even one traffic ticket were

locked up for a year to get them off the roads, you would actually get rid of only about 3-5 percent of the accidents the next year. That is because of the way accidents and violations are distributed in the population. The repeater accounts for a relatively small proportion of the total. So, even if you identify these reprehensible few and confine them, you still don't wipe out the problem, because most of those who have accidents the next year are having an accident for the first time.

So, while there is some utility in dealing with accident repeaters, it certainly does not make the kind of inroads on the problem that the catch phrase would indicate. That 1930s research, by the way, was replicated in the 1960s in California, and again in the 1970s in North Carolina.

On the other hand, I think the liberals' catch phrase that "education doesn't work" is equally questionable as a behavior theory. It's more of a political theory. As a matter fact, I was a member of the delegation that went to China and was with a bunch of injury control specialists. As we were riding on the bus, we were talking back and forth and most everybody was agreeing that "education doesn't work," that you can't achieve highway safety by changing human behavior. Then everyone got off that bus, walked around its front and, as they were saying education doesn't work, each one looked to the left, looked to the right, looked to the left again, and walked on across. Everyone of them did that.

I happened to be last one off the bus, so I asked, "You say education doesn't work, why did you look to the left and right? Were you born knowing how to do that? Does that 'looking' behavior have value? Did you learn that behavior?"

It is interesting to note, both of these two "theories" of human behavior are fairly authoritarian in nature. If you follow the conservative reasoning of get-the-nut-off-the-road theory, that means you bring the force of government to bear on these "bad guys" and you deprive them of something—take the license away, make him go to school, etc. It's somewhat the same with the liberal theory, because the kind of programs liberals embrace are fairly authoritarian too, but they intend to deal with whole groups of people. For example, the more nearly liberal spokesmen are in favor of raising the drinking age from 18 to 21. In this you take something away from a whole class of people. The idea seems to be that if we can't figure out which individual is going to drink irresponsibly, let's raise the drinking age from the whole class. That's also a fairly authoritarian thing to do.

So you get these tensions—on one hand the conservatives emphasize voluntary use of seat belts, and on the other hand the liberals advocate air bags. In fact, just the day before yesterday, I was testifying before a Senate committee and one of the senators, a conservative Republican, was asking the witnesses if it wouldn't be more appealing and effective if we could just *persuade* people to wear seat belts rather than to pass seat belt laws. Obviously, it appealed to him to avoid the use of government force to try to achieve belt usage. Other senators at the same table were saying it would be more appealing but it hasn't worked anywhere. Nowhere in the United States have we ever been able to increase seat belt usage through voluntary educational programs; not even one such program has been as good as *every* state has achieved when they passed a seat belt law. Every state that has passed a seat belt law has experienced at least a doubling (usually a tripling)

of seat belt use. That has never been demonstrated in a voluntary setting before.

Another conservative approach, with respect to drinking, would be the control of the abusive use of alcohol. Some of the liberals would want to address the problem through tax policy. For example, the alcohol in beer is taxed less heavily than the same volume of alcohol in hard liquor. One result is that there are some places where a young person can get a six-pack of beer cheaper than a six-pack of soft drinks. So, some of the liberals say that we ought to have a tax policy to fix that, especially since beer drunkenness is the primary source of drunk driving fatalities in North Carolina. I wouldn't be surprised if the same thing were true in Kentucky. Again, the conservatives would emphasize individual responsibility for drinking, the liberals would say let's ascribe some of the responsibility for alcohol abuse to the seller of alcohol.

From the examples I have given, our society is infused with some of both approaches. We do have enthusiastic, extensive programs to deal with the individual abuse of alcohol, but in some states we're beginning to use tax policy and laws to add to that.

We have extensive programs for the voluntary use of restraint systems, but we also have the automatic restraint systems coming in. We have highways that are safe in terms of preventing accidents, but we have come to accept what wasn't very acceptable a few decades ago, and that is crash safety features (now pretty much accepted as standard practice)—treatment of gore areas, use of breakaway poles, shallow ditching, etc.

We have benefitted from this creative tension, I would say, because we have seen infused into our policy a number of initiatives that have their origins from these two political views. And, I think we're better off for it.

What about the future of highway safety? The future holds significant threats to both the safety and the mobility we've been trying to balance for 60 years. Certainly, in some areas of the country, capacity limits are a threat to the mobility. Capacity problems are one of the driving forces behind intelligent highway initiatives now under consideration.

We have threats to safety, partly because of economic considerations. We have threats to safety growing out of fuel economy considerations and the consequent necessity for building smaller cars. Looking to the next 10, 20, or 30 years, you can show that even with the modest growth we've experienced in the past 10-15 years, we could easily rise to 65,000 or even 85,000 annual fatalities. In order to "hold our own" and keep the fatalities below 50,000, it would mean reducing the death rate in the whole country to below 2.0, or even 1.5. The latter would be a national level of performance exceeding what we can achieve even on our very best of our facilities. One wonders if we can do that. We already have reached our historic low. One wonders how much lower the rate can go.

In some respects, we will get a boost from urbanization. The more urban our country becomes, the lower our death rate will be simply because in more congested areas conditions, such as speed-induced fatalities, are not as frequently encountered. (You certainly get capacity problems however).

Therefore, what are we going to do? I don't know the answer, except to say that I think we have the institutions in place here in Kentucky, in North Carolina, and elsewhere in the United States to address the problems. We

now have levels of professional training that routinely take into account the balancing of safety and mobility in ways that were not so 25 or 30 years ago. We have a range of people that we didn't have 30 years ago interested in and working on the problem.

We have improvements in the treatment of the injured at trauma centers, improvements in the removal of the injured from an accident site. We have a lot of people interested in the problem, working on the problem, and there are resources that were not available in the past. Therefore, I'm fairly confident that progress will continue to bring the death rate down. But it isn't going to be easy because we've already done the easy things. The last 30 years have seen many important improvements, but there are still lots of things to be done, some of them politically feasible and some not.

One of the things we don't do in this country for example is random breath testing for alcohol. In Australia, in the state of New South Wales (where Sydney is located), police are authorized to do a quick prescreening alcohol test with anybody anytime. They do millions of these tests each year. Your probability of being stopped and asked to blow into the tube is about one in three per year. We can't do that in this country. It's illegal, and I don't think there is political interest in *making* it legal. But, they do it in Australia and have reduced drunk driving very significantly.

Along with their two major initiatives (the dramatic initiatives that affect alcohol abuse and the great success of their seat belt laws), Australia has basically caught up with the USA in terms of the 100-million-mile death rate. I use that example because we know that while we have this hopefully creative tension between liberal and conservative views of the problem, we, nevertheless, have some things that we're willing to do in the name of safety and some things that we are not willing to do.

I'm fairly optimistic. I think we have the institutions in place and the dedicated professionals. I don't expect to see 65,000 and 85,000 fatalities per year in this country. I don't say we're going to hold the line, but I do think that we will be able to continue with counter measures to insure that our highways continue to be the safest in the world. Thank you.

Question:

Are you saying the gridlock that we're experiencing right now is a flux?

Answer:

In a teasing sense, gridlock is the best thing for highway safety. If you can't move, you can't have a bad crash. We once did a regression analysis of the death rates in all 50 states for all the census periods since the 1930s. We found that about half of the variance of the improved death rates that we have experienced over the last 50 years are associated with the degree of urbanization. In a place like Connecticut, there are fewer places you can drive fast enough to kill yourself. I don't think there's any doubt the more rural states (like North Carolina and Kentucky) have a tougher time if you use fatalities as a criterion.

Question:

What about the age question. At the turn of the century, one out of six people will be 65 or older. Do you have any background on these drivers as to the basis of fatalities?

Answer:

If I could show you a graph where the line across the bottom was age and the line up the side was accident rates, the curve would be "U" shaped. The rate is very high for the young, plunges dramatically and bottoms out at about 50 or 55 years old, and then begins to climb slightly after that. That is the sole advantage of middle age that I can tell!

I think the one thing that is changing in this age group is the increased use of cars by people who are a great deal older than 65. But the elderly tend to self-limit a great deal by not driving as many miles and not driving at night. So, on a whole-number basis (a raw frequency basis) they probably correct their increased rates.